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Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of

Redevelopment of Spectrum to
Encourage Innovation in the
Use of New Telecommunications
Technologies

ET Docket No. 92-9

To: The Commission

Comments of the Hewlett-Packard Company

Introduction

As a founding member of the Wireless Information Networks Forum (WINForum), Hewlett-Packard (HP) has participated in the creation of and fully supports the comments submitted by WINForum. As a member of WINForum, HP seeks spectrum not for itself, but for a new industry struggling to realize a new world of anytime, anywhere, anyone personal communication. HP believes the best way to launch this exciting new industry, which will blend the best of digital computing with digital telecommunications and wireless communication, is the allocation of spectrum for user-provided, voice and data personal communications services (User-PCS, as discussed in the WINForum comments). Therefore, while these comments on NPRM are HP's alone, HP wishes them to be viewed as our particular elaboration on the concepts presented in the WINForum submittal.

We have divided our comments into two categories. First we have provided some elaboration on our particular concept of User-PCS and why we feel it deserves a privileged status in the deliberations over spectrum for emerging technologies. Second, we have provided specific comments on the NPRM itself.

To summarize our views, we regard local-area user-provided data, voice, and voice+data PCS as a unique new service that epitomizes the type of emerging technologies the Commission seeks to foster. In our evaluation of the NPRM, we recommend that the Commission seek to:

(1) Clearly differentiate between user-provided PCS and carrier-provided PCS;
(2) Adopt a more aggressive stance on transition of spectrum to emerging technologies, and provide an immediate clear allocation for user-PCS;
(3) Clearly establish a priority in favor of mobile uses of spectrum as a matter of general policy;
(4) Prioritize new spectrum allocations in the ET band for new services over expanding existing services.

A Discussion of User-PCS

To begin, HP enthusiastically supports the proposal by the FCC to allocate spectrum to emerging technologies, and particularly to User-PCS, as an immediate priority.

In our view, User-PCS is a limited-range extension of both data and voice wireline services (primarily LANs and PBXs in business environments) provided by the user for use at the office, home or other place of business or leisure. User-PCS products would be purchased, installed and administered on the user premises. In this respect, User-PCS products are much more like a cordless phones than a cellular phones, to use familiar examples. User-PCS has no "tariff" associated with its use.
We anticipate the development of many compelling voice, data and voice+data applications, including but not limited to: (a) multi-party interactive conferencing, using voice, shared sketch (data) pad, and active speaker identification; (b) personal information management including shared calendars with notification and real-time updates; access to local and remote phone directories; taking, indexing, storage and retrieval of notes; (c) access via internetworks to a vast store of personal, corporate and commercial data and services; (d) telephone, voice mail and electronic mail, enhanced with crossover technologies like speech-to-text, text-to-speech and voice annotation. With the advance of technology, users will want to choose from a range of devices from simple phones to integrated communicating computers or "information appliances" with voice and data capabilities. HP is committed to a future User-PCS environment that fully integrates voice and data; therefore, we do not advocate separate voice and data bands.

HP supports the FCC concept of spectrum for emerging technologies. Investment in new technologies for User-PCS will be encouraged by a spectrum allocation and companion regulatory environment that embraces the coexistence of a broad range of otherwise incompatible services.

To accomplish peaceful sharing of a User-PCS band, we advocate a "minimalist protocol" approach. As a WINForum member we are committed to working with other members to define such a sharing protocol that results in sufficient development freedom, and adequate protection from interference. Furthermore, we believe the WINForum to be an ideal partner for the FCC in designing such a "minimalist protocol" as the basis for regulation of a non-licensed spectrum allocation as proposed for User-PCS.

Preliminarily, HP supports two key principles in establishing a minimalist protocol for band sharing: (1) minimum power (approximately 10 mW typical, 250 mW maximum) combined with (and as a result of) short propagation distances (30-100 meters); (2) an adaptive channel assignment technique for allocating frequency channels to contending systems.

On the issue of the spectrum allocation size, HP agrees with the WINForum minimum requirement of 40 MHz. We offer the following additional observations as food for thought. HP sees User-PCS devices as small, lightweight and inexpensive. They operate on battery power for long periods (ideally many weeks without replacement or recharging). The HP 95LX Palmtop Computer and a variety of CT2 and DECT phones are notable examples of what is already available today. Such ergonomics, when combined with current technology constraints, will limit early mobile User-PCS devices to modest data transfer rates of perhaps 0.5 to 1.0 Mbps. While the bandwidth requirement for voice is essentially fixed, experience with wireline LANs has shown that data applications (as a class) have no inherent upper bandwidth limit. Therefore it is expected that the desired bandwidth for a voice+data User-PCS will grow with the progress of technology, and be limited primarily by the aforementioned ergonomics. It is quite conservative to predict a need for up to 200 MHz of spectrum for User-PCS within 10 to 20 years.

HP recommends that the FCC give the highest priority to User-PCS in its consideration of spectrum for emerging technologies. At present, in the wide-area voice and data environment, personal communications services are provided by cellular technology. There is already significant spectrum allocated for these services and plans exist for upgrading the technology to support digital services with significant increases in capacity and quality, plus the addition of packet data. At present, there is no spectrum suitable for User-PCS as the WINForum has defined it. Allocation of spectrum to User-PCS with an appropriately flexible "minimalist protocol" will allow the creation of whole new categories of communicating/computing devices and the supporting network infrastructure products, creating a whole new industry. The concept of a flexible use spectrum will encourage innovation and rapid technology evolution that is more difficult to achieve in the necessarily more regulated and licensed environment required for wide-area services, such as the current cellular network. Furthermore, the local user-owned and -operated aspect of User-PCS products will allow for rapid deployment without the need for large, coordinated capital investments.

Specific Comments on the NPRM

Clear Differentiation Between User-provided and Carrier-provided Services

HP suggests that the Commission clearly differentiate between the user-provided and carrier-provided types of PCS. As the NPRM currently stands, it often assumes a carrier-provided model in its discussion of an allocation for emerging technologies. Without such clear differentiation, it is our opinion that a reasonable dialog on key issues such as spectrum clearing, amount and location of spectrum, and the timetable for various allocations, cannot be meaningfully conducted. We recommend that the NPRM be revised to clearly provide for user-provided PCS (User-PCS or UPCS) and carrier-provided PCS (Carrier-PCS or CPCS). Provision should be made for the different approaches required for regulation,

spectrum clearing (including the handling of incumbents), and prioritization between the types of services.

Transition Plan

As discussed in the NPRM, we find that the transition plan discussion lacks a sense of urgency. Periods of time like 10 or 20 years for clearing and allocating spectrum are, in our opinion, tantamount to doing nothing. The rest of the world is not waiting. Spectrum is being aggressively allocated and reserved for UPCS and CPCS services in Europe and Japan (see comments submitted by IEEE 802 committee). We cannot overstate the urgency to create at least some minimal allocation for UPCS as the most feasible way to foster the technological development and innovation the emerging technologies NPRM expounds, and which HP wholeheartedly supports.

To support our desire for differentiation between UPCS and CPCS, we recommend that the Commission provide separate transition plans for non-licensed user-provided PCS and licensed, carrier-provided PCS. Coexistence of licensed CPCS services with existing incumbents may be feasible; but it is doubtful that incumbents or UPCS suppliers and users would find spectrum sharing viable.

We further suggest that the FCC immediately suspend the issuing of any new licenses in the targeted ET band, and that the Commission begin immediately to target additional bands as a reserve for PCS. We believe this additional reserve can be allocated from spectrum above the 1-3 GHz range considered in the present NPRM. HP supports extending the search for a suitable spectrum reserve to 6 GHz, anticipating the economical use of these frequencies (comparable to today's economics in the 2 GHz region) as foreseeable technology advances come to fruition. It is clear to us that, shortly after the first PCS solutions become available, the value of such services will cause the demand for spectrum to exceed even some of the higher estimates the Commission has already seen. Once PCS is initiated in the 2 GHz band, the public will no longer view PCS as a fantasy, but a highly-desired reality. A significant spectrum reserve will result in the Commission's having the flexibility to act rapidly in meeting this anticipated public demand.

First Priority Should be Given to Spectrum for Mobile Applications

HP strongly advocates the allocation of spectrum to mobile applications that cannot be implemented with wireline technology. In the past, when the spectrum was less congested, it was reasonable to utilize spectrum for fixed applications. But as we strive to provide ubiquitous computing and communications, with no alternative but wireless solutions, there will be an ever-increasing need for spectrum. We strongly encourage the Commission to give the highest priority to allocating spectrum for mobile applications, and to embrace an onrushing future of mobile PCS in all its manifestations.

High Priority Should be Given to Emerging Technologies

The stated goal of the Emerging Technologies NPRM is the support of new technologies that will lead to new services and new industries. HP recommends that the Commission give higher priority to allocating spectrum for new services. Specifically, we favor spectrum for user-PCS as the most immediate unmet need. While existing services may need additional spectrum in the future, their need is not as urgent.

Conclusion

HP is in agreement with the general direction the Commission is taking. We will continue to be involved in the process through our participation in WINForum and as an individual company concerned with these proceedings. Hewlett-Packard urges the Commission to proceed with all possible speed to implement new Emerging Technologies Bands, taking into account the comments and discussion set out above.

Respectfully submitted,

The Hewlett-Packard Company

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